

About the Influence of the High Gravitation on Kinetic Factors of Substances

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There are no direct measurements or theoretical works devoted to the influence of the high gravitation on kinetic factors of conductors in the literature. However, indirect experiments connected with the influence of acceleration on the presence of free electrons in metals are present. The concepts are available in the field of space electrodynamics. [1].

The purpose of the present work is to analyze existing representations to formulate an experimental basis of realization of experiments on the influence of the high gravitation on kinetic factors of metals and semiconductors (electroconduction). The investigation on measurement and conductors before acceleration 10^3g is made at temperatures from room up to 1000K.

The analysis of experimental data is carried out using the equation

$$\sum F_i = m \sum a_i \quad (1)$$

Where F_i includes Lorentz and Coriolis forces. A_i includes Coriolis and centrifugal accelerations.

By consideration of working forces not of magnetic origin (for example, centrifugal and Coriolis force) f , the conducting center is continuously displaced, that is drifts with some certain speed, which is designated by U . Differentiated equation of movement

$$\vec{r}_c = \vec{r} + \vec{\rho} = \vec{r} + \frac{\vec{C}}{CB^2} \times \vec{B} \quad (2)$$

Where r and ρ are radius vector and pulse of particles, B is magnetic field

$$\vec{U} = \frac{d\vec{r}_c}{dt} = \vec{V} + \frac{C}{CB^2} \frac{d\vec{\rho}}{dt} \times \vec{B} \quad (3)$$

(Under condition of B is homogeneous and constant) If in this expression we substitute the equation of movement

$$\frac{d\vec{\rho}}{dt} = \vec{f} + \frac{c}{c} \vec{v} \times \vec{B} \quad (4)$$

Using the vector identity

$$\left(\vec{V} \times \vec{B} \right) \times \vec{B} = \vec{B} \left(\vec{V} \cdot \vec{B} \right) - V B^2 = \vec{V}_{||} B^2 - \vec{V} B^2 = -\vec{V}_{\perp} B^2 \quad (5)$$

we get

$$U = V_{11} = -\frac{C}{CB^2} \vec{B} \times \vec{f} \quad (6)$$

The movement of the conducting center can be presented as set of displacements caused by continuous short-term collisions, each of which results the increase Δr_c according to the formula

$$\Delta r_c = \frac{c}{cB^2} \Delta \vec{P} \times \vec{B} = -\frac{c}{cB^2} \vec{B} \times \int_t^{t+\Delta t} \vec{f} dt \quad (7)$$

In such case the speed, perpendicular magnetic field is equal to $\Delta r_c / \Delta t$, that again results in the equation (6). Spreading out U on perpendicular and parallel to field B components, we get

$$\vec{U}_\perp = -\frac{C}{CB^2} \vec{B} \times \vec{f} \quad (8)$$

$$\frac{d}{dt} \left(\gamma m \vec{U}_\perp \right) = \vec{f}_\perp \quad (9)$$

At last, we have constructed the diagrams of electron movement and its conducting center.

- [1] G. Alvin. K-g. Felt hammer. Space electrodynamics. M. i Mirî (1967).
- [2] Sh. Mavlonov. Influence of the high gravitation on kinetic factors of semiconductors, theses of the reports at an all-Union conference in Navoi city, (1991).